



## Congestion and Spatial Equilibrium Models

**Start Date:** Jun 2004

**Projected  
End Date:** Sep 2005

**Lead Researcher(s):**

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**Problem Addressed:**

The Corps uses a variety of equilibrium models to assess the benefits and costs of improving the nation's inland waterway transportation system. Each of these models assess costs and benefits using a variety of assumptions relating to demand and to forecasts of future traffic both with and without the project. Commodities may be shipped by several alternative routes (truck, rail, barge or various combinations of the three). Equilibrium specifies what is shipped and how. Determining the equilibrium for waterways is quite complicated in that there are multiple commodities and multiple spatial locations of demanders and suppliers, all of which theoretically can be affected through shared transportation networks. For example, when the corn harvest hits Iowa, the corn can be exported through different ports to different foreign countries or to local markets within the US. It can be shipped by a variety of different modes e.g., truck, rail, and barge. Quite a lot of this corn travels by barge to New Orleans for export. This places pressure on the waterway system, increasing congestion and transit times. By so doing, shippers of other commodities e.g., a quarry in Saint Louis, steel shippers, coal shippers, etc- may be impacted by the upward pressure placed on rates and by transit times.

**Objective:**

The primary objective of the research is to develop an equilibrium model that will capture the effects of geographically dispersed suppliers and demanders of different commodities that share or could share the nation's inland waterway system.

**Benefits:**

That resulting model will allow for simulations of waterway improvements at the individual lock level or at a system level. If successful, this model also will allow a number of other assumptions to be evaluated, including theories about the reallocation of shipping from the waterways to trains after a certain threshold is hit.

**Status:**

Completed.

**Contract Data:**

IWR 2004

**Progress:**

[Paper by Simon Anderson and Wesley Wilson, February 2005 \(303 KB, pdf\)](#)

[Paper by Simon Anderson and Wesley Wilson, April 2005 \(394 KB, pdf\)](#)

[Paper by Kenneth Train and Wesley W. Wilson,](#)

**Products (Bookshelf/Toolbox):**

[Paper by Simon Anderson and Wesley Wilson, November 2004 \(1.33 MB, pdf\)](#)

[Paper by Simon P. Anderson and Wesley W. Wilson, December 2005 \(569 KB, pdf\)](#)

[Paper by Simon Anderson and Wesley Wilson,](#)

[Oct 31, 2006](#) (114 KB, pdf)

[September 2005](#) (628 KB, pdf)

[Presentation by Simon Anderson, Jan 5, 2007](#)  
(712 KB, ppt)

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**Related Links:**

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